

# IMPORTANT PRODUCT INFORMATION

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## READ THIS INFORMATION FIRST

**Product: Logicmaster 90-30/20/Micro Software Package Version 6.01  
Programmer and Configurator**

IC641SWP301S –3.5-inch 2DD, 5.25-inch 2S/HD (WSI Version)  
IC641SWP306L –3.5-inch 2DD, 5.25-inch 2S/HD (Standard Serial COM Port)  
IC641SWP300B – 3.5-inch 2DD, 5.25-inch 2S/HD (Micro Standard Serial COM Port)  
IC641SWP311A –Sequential Function Chart (SFC) Programmer  
IC641SWP303N –Demonstration Package (Standard Serial COM Port)

Read this document before installing or attempting to use Release 6.01 of Logicmaster™ 90-30/20/Micro programmer and configurator software with your Series 90™ 30, Series 90-20, or Series 90 Micro PLC system. For more information, refer to the README.TXT file on the master diskette.

IC641SWP301 and IC641SWP306 support programming and configuration of the Series 90-30, 90-20, and Series 90 Micro PLCs. IC641SWP300 supports programming and configuration of the Series 90 Micro PLCs only. Beginning with Release 5.01, Sequential Function Chart programming capability is available by ordering the desired Logicmaster 90 version (IC641SWP301, IC641SWP306) and the SFC Programmer Option diskette (IC641SWP311). Refer to the “New Features Introduced in Release 6.01” section for details.

## Operational Notes

- 1. Compatibility with Earlier Releases:** Logicmaster 90-30/20/Micro Release 6.01 is compatible with Release 6 and earlier 90-30 and 90-20 CPUs and Release 1 Series 90 Micro PLCs. However, some new features found in Logicmaster 90-30/20/Micro Version 6.01 require an upgrade of CPU firmware to Release 5 or later to be fully available. Refer to the “Using Release 6 Logicmaster 90 with Release 5 or Earlier Series 90-30/20/Micro CPUs” section.

<b>CAUTION</b>
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Folders created with all earlier releases of Logicmaster 90-30/20 software are upwardly compatible. Folders created with Logicmaster 90 version 6.01 are fully compatible with Logicmaster 90-30/20 3.50 or later. However, once a logic program or configuration is created or modified with Release 6.01 of Logicmaster 90-30/20/Micro, it can not be used with Logicmaster 90-30/20 Release 3.02 or earlier software. Also, once a logic program or configuration is stored to a PLC with Release 6.01, the program **MUST NOT** be loaded by an Logicmaster 90-30/20 release earlier than 3.50. If you attempt to use a folder created in Release 6.01 with Release 3.02 or earlier software, you will receive one of two messages “Folder contains files which are incompatible with this release” or “Program file corrupted.”

## 2. System Requirements:

- The Logicmaster 90-30/20/Micro Release 6 WSI version requires a *minimum* of 520 KB (532,480 bytes) of available DOS application memory in order to run. The Standard Serial COM Port version requires either a *minimum* of 564 KB (577,536 bytes) of available DOS application memory, or 520 KB (532,480 bytes) of available DOS application memory *and* 42 KB of available High Memory Area, Upper Memory Block or Expanded Memory for the COM port driver — see *Logicmaster 90 Series 90-30/20/Micro Programming Software User's Manual* (GFK-0466G), Chapter 6, Section 3 for details.
- Both versions require a minimum of 1024 KB of Lotus/Intel/Microsoft Expanded Memory (LIM EMS 3.2 or higher) for optimum performance.
- Some folders may require additional memory. If additional DOS application memory is required, system software error ID: 0000 EX: 0000 will occur. Check the AUTOEXEC.BAT and CONFIG.SYS files to remove any device drivers and Terminate and Stay Resident (TSR) programs to make more application memory available. For example, Logicmaster does not require the ANSI.SYS driver.
- The Logicmaster 90-30/20/Micro software will occupy about 4 MB of disk space. Please make sure you have adequate space on your disk before attempting to install the software.
- DOS Version 5.0 or later.
- 80386 or higher computer.
- For the Standard Serial COM Port version, a computer with a serial COM Port serviced by the National Semiconductor 16550 UART is recommended.

## 3. Logicmaster 90-30/20/Micro Installation (IC641SWP301, IC641SWP306)

For detailed instructions on installing the Logicmaster 90-30/20/Micro software, refer to Chapter 2 of the *Logicmaster 90-30/20/Micro Programming Software User's Manual*, GFK-0466G. Remember that Logicmaster 90-30/20/Micro software is licensed to run on a single computer. If you are installing Logicmaster for the first time, you must enter the serial number found on the back of your disks (unless you have the upgrade version).

The INSTALL disks are copy protected. Since backup copies of these disks cannot be made, they should be used to install the software and then stored in a safe place.

## 4. Micro Version (IC641SWP300)

The Logicmaster 90 Micro version will install into the LM90M directory on the disk specified during the install. For example, if you specify that the Micro version software be installed on the C: drive, it will be installed in the C:\LM90M directory. To run the Micro software, type the following from the DOS prompt:

```
CD \LM90M then press Enter
Then type LM90M and press Enter
```

## 5. SFC Programmer Installation (IC641SWP311)

The Sequential Functional Chart (SFC) Programmer (IC641SWP311) diskette updates Logicmaster 90-30/20/Micro Release 5 or later to provide SFC programming capability. You must install Logicmaster 90-30/20/Micro Release 5 or later *first*. Then install SFC with the SFC Programmer diskette (by typing **INSTALL**, e.g., **a:install**).

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- 6. Demo Version (IC641SWP303):** The Logicmaster 90-30/20/Micro Demo version will install into the LM90DEMO directory on the hard disk specified during the install. For example, if you specify that the demo version software be installed on the C: drive, it will be installed in the C:\LM90DEMODirectory. To run the demo software type the following from the DOS prompt:

```
CD \LM90DEMO then press Enter
Then type LM90DEMO and press Enter
```

The demo version is fully functional. However, the program size is limited to 750 bytes for the MAIN block and 750 bytes/program block.

- 7. Running Logicmaster 90 from a Disk That Does Not Contain the Logicmaster 90 Software:**

If you need to run Logicmaster 90-30/20/Micro from a disk that does not contain the software, you should setup the \$PLCROOT environment variable in your AUTOEXEC.BAT to point to the location of the Logicmaster 90 software:

```
SET $PLCROOT=(drive ID):\LM90
```

- 8. Logicmaster 90-30/20/Micro Performance:**

Logicmaster 90 software requires that the CONFIG.SYS file has BUFFERS set to at least 15 (BUFFERS=15). To increase performance, the buffers should be increased. If you have MS-DOS 5.0 (or higher) and load DOS High, you should be able to set buffers up to 48. This will help the performance of program searches, program loads, program stores, and other disk operations.

Beginning with Release 3.50 of Logicmaster 90-30/20 software, the variable tables that once were in memory have been moved to disk. While up to 5000 nicknames are now allowed in the MAIN variable declaration table, the performance of Logicmaster 90 software may be affected. For best performance, Lotus/Intel/Microsoft Expanded Memory (EMM) version 3.2 or higher of at least 1024 KB and SMARTDRV should be provided.

A memory manager is required for the Standard Serial COM Port version of the Logicmaster 90 software. A memory manager is provided with MS-DOS 5.0 (or higher) for a 386 or higher computer. However, some computers or PC configurations will require a memory manager such as 386MAX™, QEMM-386™, or QRAM™, produced by Qualitas and Quarterdeck, respectively, to provide the maximum amount of memory for Logicmaster 90 and other applications.

The following configuration will assist you in setting up your computer to run Logicmaster 90 software optimally.

Logicmaster 90-30/20/MICRO (Standard MS-DOS 5.0 or later)	Configuration
CONFIG.SYS	DEVICE=C:\DOS\HIMEM.SYS DOS=HIGH,UMB DEVICE=C:\DOS\EMM386.EXE 1024 RAM X=CE00-CFFF FILES=20 BUFFERS=48

### Note

The above EMM386.EXE switch "X=CE00-CFFF" is used to reserve this area of memory for the Series 90-70 WSI card. If the computer does not have a WSI card, it is not required.

™ 386MAX is a trademark of Qualitas.

™ QEMM-386 and QRAM are trademarks of Quarterdeck Office Systems.

- 9. MS-DOS Version 6.0 and Double Space:** Release 6.01 of Logicmaster 90-30/20/Micro software has been tested on several computers using MS-DOS Version 6.0 and Double Space on both COMPRESSED and UNCOMPRESSED volumes without any problems. However, the release of Double Space with MS-DOS Version 6.0 has been unstable on some computers. If you are experiencing problems running Release 6.01 of Logicmaster 90-30/20/Micro software with MS-DOS Version 6.0 and Double Space, contact GE Fanuc Technical Support to report the problem you are experiencing along with your computer type and the contents of your **AUTOEXEC.BAT** and **CONFIG.SYS** file contents. To avoid these problems, you may wish to install Logicmaster 90-30/20/Micro software and create program folders on the UNCOMPRESSED volume, normally **H:**.

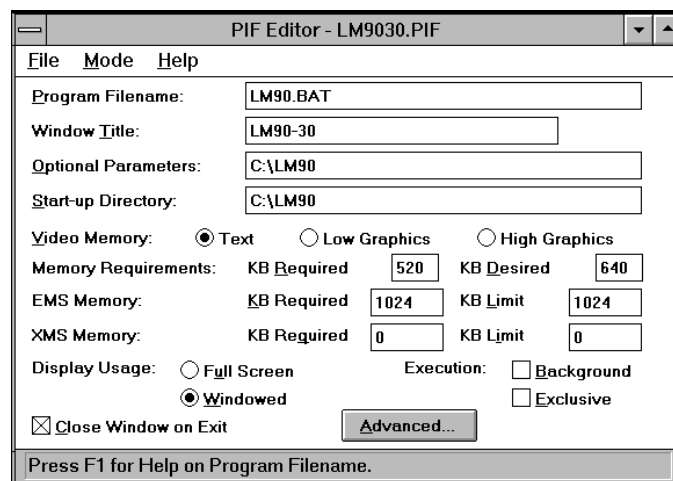
Double Space requires a driver that is about 43 KB. This driver may need to be loaded into Upper Memory (UMB) using the **DEVICEHIGH** command in the **CONFIG.SYS** file in order to provide enough memory for Logicmaster 90-30/20/Micro software.

- 10. Using MS-DOS to Copy Folder Files:** MS-DOS should *not* be used to copy individual files from one folder to another or to delete files; doing so may result in corrupted folders. MS-DOS may only be safely used to copy an entire program folder to another program folder of the same name. For most copying needs, however, use the **Copy** function within the Logicmaster 90-30/20/Micro software.
- 11. Serial Printing:** The serial ports, COM1 and COM2, can be used for serial printers. Beginning with Release 4.50, the serial printer port must be configured with the MS-DOS mode command to match the printer settings. Refer to *Logicmaster 90-30/20/Micro Programming Software User's Manual*, GFK-0466G, chapter 6, section 6, "Serial Print Setup" for details.
- 12. PLC Communication Options:** If more than one communications option (WSI and Standard Serial COM Port) of Logicmaster are installed on the same hard disk, it will be necessary to select which version you wish to run. By default the WSI version is run. Refer to *Logicmaster™ 90 Series 90™ -30/20/Micro Programming Software User's Guide* (GFK-0466G), the "PLC Communications Options" section of Appendix C, "Programmer Environment Setup," for details.

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**13. Logicmaster™ 30/20/Micro Under Windows™ 3.x:** Beginning with Release 4.50 the Logicmaster 90-30/20/Micro Standard Serial COM Port Version can run under Windows 3.x. With Windows 3.1, Logicmaster 90-30/20/Micro may be run in windowed or full screen mode. (Previous versions may have worked in offline mode, but could not be used to communicate with the PLC.) To use Logicmaster under Windows, please observe the following guidelines:

- A. The DOS window must have at least 42 KB available in either Expanded Memory (EMS), an Upper Memory Block (UMB), or the High Memory Area (HMA) for the serial communications driver. If EMS memory is used for Logicmaster 90-30/20/Micro, you must ensure that no other device driver or TSR is using EMS memory.
- B. Logicmaster 90-30/20/Micro Release 4.50 or later may be setup to use COM1, COM2, COM3, or COM4 as the communications port for communicating with the Series 90-30/20/Micro PLCs.
- C. Logicmaster 90-30/20/Micro Release 4.50 or later should be run using a PIF file. A default LM9030.PIF file is provided in the C:\LM90 directory. The following are the settings in the default PIF file. For the Logicmaster 90 Micro Software (IC641SWP300), a default LM90M.PIF file is provided in the C:\LM90M directory.



PIF Editor - LM9030.PIF

File Mode Help

Program Filename: LM90.BAT

Window Title: LM90-30

Optional Parameters: C:\LM90

Start-up Directory: C:\LM90

Video Memory: ☒ Text ☐ Low Graphics ☐ High Graphics

Memory Requirements: KB Required 520 KB Desired 640

EMS Memory: KB Required 1024 KB Limit 1024

XMS Memory: KB Required 0 KB Limit 0

Display Usage: ☐ Full Screen ☒ Windowed

Execution: ☐ Background ☐ Exclusive

☒ Close Window on Exit Advanced...

Press F1 for Help on Program Filename.

**Advanced Options**

**Multitasking Options**  
 Background Priority:  Foreground Priority:   
☒ Detect Idle Time

**Memory Options**  
☒ EMS Memory Locked ☐ XMS Memory Locked  
☐ Uses High Memory Area ☒ Lock Application Memory

**Display Options**  
 Monitor Ports: ☐ Text ☐ Low Graphics ☐ High Graphics  
☒ Emulate Text Mode ☐ Retain Video Memory

**Other Options**  
☒ Allow Fast Paste ☐ Allow Close When Active  
 Reserve Shortcut Keys: ☐ Alt+Tab ☐ Alt+Esc ☐ Ctrl+Esc  
☐ PrtSc ☐ Alt+PrtSc ☐ Alt+Space  
☐ Alt+Enter  
 Application Shortcut Key:

Press F1 for Help on Priority.

- D. You should not attempt to run more than one session of Logicmaster 90-30/20/Micro at the same time. Doing so may result in corruption of the program folders.

However, you may bring up the Programming and Configuration software at the same time provided that one of them is offline or that each of them uses different COM ports. Exercise care not to change the CPU model configured from the Configurator while you are in the program editor or reference tables in the programming software. If you wish to access the same folder from both the Programming and Configuration software packages, you will need to ensure that SHARE.EXE is not used in the AUTOEXEC.BAT file. If SHARE.EXE is used in the AUTOEXEC.BAT file and you access the same folder from both the Programming and Configuration software packages, then you will receive a "File System Error" message.

- E. For some display adapters and drivers, you may find that Logicmaster 90 is not displayed in color in Windowed mode. However, Logicmaster 90 will be displayed in color in Full Screen mode. You may switch between Windowed and Full Screen mode using the **ALT-ENTER** keystroke combination.

The WSI version may also be run under Windows 3.x. To setup the WSI card to be able to communicate with the PLC, you must run C:\LM90\WSIWIN.EXE before invoking Windows.

## New Features Introduced in Release 6.01

1. **New CPU351 Programming/Configuration** – Beginning with Release 6.01, the Logicmaster 90-30/20/Micro software allows programming and configuration of the new CPU351 model. If you are selecting a folder that was previously created for a different CPU model and you changed the hardware configuration to a 351 CPU, you will be prompted to allow Logicmaster to convert the logic in the folder to be compatible with the 351 CPU. If you plan to use the folder again with lower model CPUs, Logicmaster does allow that; but you *must* stay with the memory limit and program size limits of the lower model CPU.

If you store a program that was written using a CPU hardware configuration other than model 351 to a 351 CPU, you will be prompted to convert the folder to be compatible with the 351 CPU when you start the store process.

The logic size of a non-351 program may increase during translation. If the **\_MAIN** block or a subroutine block is close to its size limit, you may experience an error during translation. You will need decrease the logic size for a successful translation.

2. **Variable Declaration Table Import/Export** – You now have the ability to import Variable Declarations into the Variable Declarations Table using a Comma Separated Variable (CSV) format and to export Variable Declarations from the Variables Declaration Table with Logicmaster, placing the variables into CSV format. This lets you create and edit your Variable Declarations using a spreadsheet program or a text editor. For information on how to use Logicmaster to import and export variables in CSV format, refer to the *Logicmaster 90™ Series 90™ -30/20/Micro Programming Software User's Manual* (GFK-0466G), Chapter 3, Section 5 and Appendix I, "Variable Declaration Table Import/Export Using CSV Format." The most recent addition to the functionality of this feature was not included in that appendix (see below).

### Addition to the User's Manual

Appendix I, "Variable Declaration Table Import/Export Using Comma Separated Variable (CSV) Format," of the *Logicmaster 90™ Series 90™ -30/20/Micro Programming Software User's Manual* (GFK-0466G) does not include the following guidelines for use of a recently added feature. This information should be included on page I-3, s.v., "The Header Section," and will be included in the next edition of the manuals.

**##&&DelV arDecl** This identifies the blocks for which the Variable Declaration Table should be deleted before the import occurs. The possible values are "ALLBLOCKS" to delete the Variable Declaration of all blocks, "\_MAIN" to delete the program's global Variable Declaration, or the name of the desired blocks can be listed (as in the second example shown below).

#### EXAMPLES

#&&DelV arDecl, \_MAIN

or

#&&DelV arDecl, \_MAIN, Block1, SLIDE

or

#&&DelV arDecl, ALLBLOCKS

- 3. Programming/Configuration of New Series 90 Micro PLCs** – Beginning with Release 6.01, Logicmaster 90-30/20/Micro software package allows programming and configuration of the following future Micro PLCs:

IC693UDR005 – 28 Point DCIN/RLYOUT, AC PS Micro PLC

IC693UAA007 – 28 Point ACIN/ACOUT, AC PS Micro PLC

IC693MFP100 – Micro Field Processor

- 4. Series 90-30 Ethernet Module Configuration** – Configuration is now supported for the Series 90-30 Ethernet Module (IC693CMM321).
- 5. FANUC Digital Drive Support from APM Configuration** – The Series 90-30 Axis Positioning Modules (IC693APU301, IC693APU302) can be configured to support the FANUC Digital Drives.

### Using Release 6 Logicmaster 90-30/20/Micro with Release 5 or Earlier Series 90-30/20/Micro CPUs

Logicmaster 90-30/20/Micro Release 6.01 was designed and tested to be compatible with Release 6 or earlier 90-30, 90-20, or Release 1 Series 90 Micro CPUs while still providing new Logicmaster features. However, some new features found in Release 6.01 Logicmaster 90-30/20/Micro require an upgrade of CPU firmware to be fully available.

#### SFC PROGRAMMING

Programs that use SFC (Sequential Function Chart) programming require CPU release 5.0 or later. SFC is not supported by the Series 90-20 or Series 90 Micro PLCs.

#### SUBROUTINES

Subroutines require a 90-30 CPU. They are not supported by the Series 90-20 or the Series 90 Micro PLC.

#### PERIODICSUBROUTINES

Periodic Subroutines require a Release 4.20 (or later) 340 or higher CPU. If a program contains a periodic subroutine, it cannot be stored to a Series 90-30 341 CPU earlier than Release 4.20.

#### Note

Only Models 340 or higher Series 90-30 PLCs support use of a periodic subroutine at this time. Only periodic subroutine names of the form **1Tnn** are supported at this time (**nn** is a number from 1 to 10 which specifies the number of milliseconds between executions of the subroutine). Only one such subroutine is allowed.

#### NEW INSTRUCTIONS

The following instructions require a Release 4.50 or later 90-30 or 90-20 CPU, or a Release 1 or later Series 90 Micro CPU.

MASKED COMPARE

OFF DELAY TIMER

1 MS TIMEBASE FOR TIMERS

Use of the above instructions with a CPU that does not support the instruction will result in one of the following messages when attempting to store to program to the PLC: "Store aborted; Program in folder uses instructions not supported by PLC" or "Program size too large for PLC or invalid user program."



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## Problems Resolved by Release 6.01

1. **Installing Logicmaster 90 on Hard Disks Larger than 537 MB:** Release 6.01 of Logicmaster 90-30/20/Micro has been changed to allow it to install on hard disks with more than 537 MB available.
2. **Load Programs from CPUs Earlier than Version 3.02:** You may now load programs from Series 90 CPUs earlier than version 3.02.
3. **ID: 3247 EX: 0000 or ID: 3250 EX: 0000 Error Log During Printing:** While printing cross references for a program, the error log ID: 3247 EX: 0000 or ID: 3250 EX: 0000 could occur. This problem has been corrected. If this error still occurs, you may need to delete the print cross reference files using the Clear Current Program Folder function with the "PRINT XREF FILES" option enabled, and then restart the print global cross reference operation.

## Restrictions and Open Problems

1. **Variable Import Using CSV File Containing an SFC Name:** If you attempt to import variables using an SNF CSV file that contains a reserved SFC name (e.g., S1), the import terminates without an error message.
2. **Import of a Variable with % in the Name:** The variable import process may terminate if a variable is encountered with a % in the nickname (e.g., ZSTP%OL).
3. **Variable Reference Description Quotation Marks Stripped:** If you attempt to import a description (e.g., Servo Value "ON" Slow) with quotation marks, the quotation marks are stripped (e.g., Servo Value ON Slow).
4. **Logicmaster 90 Install Using DOS 6.0 or Later:** MS-DOS 6.0 or later supports multiple configurations in the same file. However, during an Logicmaster 90 installation changes in the CONFIG.SYS and AUTOEXEC.BAT files are only made to the first section for files, buffers, and the Logicmaster 90 path.
5. **Passwords Enable/Disable:** Attempting to store a configuration that enables passwords to a PLC with passwords disabled will result in the configuration in the PLC being cleared.
6. **Search Ref Descriptions:** If a program contains references that have the same reference description text, attempting to search for the reference description will always result in the first occurrence of the reference description being found.
7. **Rung Limit:** The maximum number of rungs allowed in the 90-30/20/Micro **\_MAIN** block is 3000 and in each subroutine is 3000.
8. **Store > 32 KB Program, Registers, etc., to CPU341 (or CPU340) EEPROM:** The maximum size of an EEPROM for the Series 90-30 is 32 KB. An attempt should not be made to store more than 32 KB to an EEPROM; if the combined total of program, registers, etc., is greater than 32 KB and you try to store it to an EEPROM, Logicmaster 90 will lock up.
9. **SFC Search:** If an SFC Topology is invalid and a source and destination connector exist with the same name, the destination connector will not be found by search if the destination connector appears below the source connector.
10. **Micro PLC and Checksum Words:** Logicmaster 90 allows the Chksum Wrds per PLC sweep to be configured for the Series 90 Micro PLC. However, the Series 90 Micro PLC does not support this configuration parameter.
11. **ADC Module Supported in Main Rack Only:** The ADC module is supported in the main rack (rack 0) only; however, Logicmaster 90 will allow the ADC module to be configured in any rack.

## Corrections to the Series 90 Manuals

In the “Revisions to This Manual” section of the Preface of the *Logicmaster 90™ Series 90™-30/20/Micro Programming Software User’s Manual* (GFK-0466G), the first paragraph incorrectly states, “Changes made to this manual reflect the features of Release 5 (November 1994) of Logicmaster . . . .” It should have stated, “Changes made to this manual reflect the features of Release 6 (May 1995) of Logicmaster . . . .”

On pages 10-60 through 10-63 of the *Logicmaster 90 Series 90-30/20/Micro Programming Software User’s Manual* (GFK-0466G), the screen captures differ slightly from the screens as they display in this release. Please refer to the *TCP/IP Ethernet Communications for the Series 90-30 PLC User’s Manual* (GFK-1084) for corrected screen captures and detailed configuration instructions.

On pages 2-22 and 2-23 of the *Series 90-30/20/Micro Programmable Controllers Reference Manual* (GFK-0467F), the tables on each page have the title “NO TAG System Status Reference (cont’d).” Each table should have had “Table 2-8 System Status Reference (cont’d)” as the title.